



**Jordan University of Science and Technology**  
**Faculty of Science & Arts**  
**Chemistry Department**

HSS103CHEM General Chemistry - JNQF Level: 7

Second Semester 2023-2024

**Course Catalog**

3 Credit Hours. The course focuses the attention on different aspects of Chemistry. It starts with discussing Chemistry: Matter & Measurements, periodic properties, the mole & Mass Relationships in Chemical Reactions, Reactions in Aqueous Solutions. In the second part of the course discusses Chemical Bonding, Gases, and the Physical Properties of Solutions are intensively discussed. In the third part, Chemical Kinetics & Acids -Bases are explained and studied.

**Teaching Method:** On Campus

**Text Book**

<b>Title</b>	CHEMISTRY The Central Science
<b>Author(s)</b>	Brown, LeMay, Bursten, Murphy and Woodward
<b>Edition</b>	13th Edition
<b>Short Name</b>	Ref.1
<b>Other Information</b>	Pearson

**Instructor**

<b>Name</b>	<b>Dr. Suaad Audat</b>
<b>Office Location</b>	D3 L0
<b>Office Hours</b>	Sun : 11:30 - 13:30 Tue : 11:30 - 13:30 Wed : 12:00 - 13:00 Thu : 11:30 - 13:30
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**Instructor**

<b>Name</b>	<b>Prof. Isam Arafa</b>
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Instructor	
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Name	<b>Dr. Ayat Bani Rashaid</b>
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Instructor	
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Class Schedule & Room
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**Section 1:**

Lecture Time: Sun, Tue, Thu : 10:30 - 11:30

Room: NB57

**Section 2:**

Lecture Time: Sun, Tue, Thu : 11:30 - 12:30

Room: NG43

**Section 3:**

Lecture Time: Sun, Tue, Thu : 11:30 - 12:30

Room: M2202

**Section 5:**

Lecture Time: Sun, Tue, Thu : 13:30 - 14:30

Room: NF37

**Section 6:**

Lecture Time: Mon, Wed : 11:30 - 13:00

Room: NF46

**Section 7:**

Lecture Time: Mon, Wed : 11:30 - 13:00

Room: NG43

**Section 8:**

Lecture Time: Mon, Wed : 14:30 - 16:00

Room: NF37

**Tentative List of Topics Covered**

<b>Weeks</b>	<b>Topic</b>	<b>References</b>
Week 1	Introduction: Matter and Measurement 1.4 Units of Measurement 1.5 Uncertainty in Measurement 1.6 Dimensional Analysis	From <b>Ref.1</b>
Week 2	Atoms Molecules and Ions 2.5 The Periodic Table 2.7 Ions and Ionic Compounds	From <b>Ref.1</b>
Weeks 2, 3	Stoichiometry: Calculations with Chemical Formulas and Equations 3.1 Chemical Equations 3.3 Formula weight 3.4 Avogadro's Number and the Mole 3.6 Quantitative Information from Balanced Equations 3.7 Limiting Reagents	From <b>Ref.1</b>
Week 4	Reactions in Aqueous Solutions 4.5 Concentrations of Solutions 4.6 Solution Stoichiometry and Chemical Analysis	From <b>Ref.1</b>
Weeks 5, 6	Basic Concepts of Chemical Bonding 8.1 Lewis Symbols and the Octet Rule 8.2 Ionic Bonding (includes Ionic Radius Trends in Chapter 7-section 7.3) 8.3 Covalent Bonding 8.4 Bond Polarity and Electronegativity 8.5 Drawing Lewis Structures 8.6 Resonance Structures	From <b>Ref.1</b>
Weeks 6, 7	Molecular Geometry and Bonding Theories 9.1 Molecular Shapes 9.2 The VSEPR Model 9.3 Molecular Shape and Molecular Polarity	From <b>Ref.1</b>
Weeks 7, 8	Gases 10.1 Characteristics of Gases 10.2 Pressure 10.3 The Gas Laws 10.4 The Ideal Gas Equation 10.5 Further Applications of the Ideal Gas Equation 10.6 Gas Mixtures and Partial Pressures 10.7 The Kinetic-Molecular Theory of Gases 10.8 Molecular Effusion and Diffusion	From <b>Ref.1</b>

Week 9	Properties of Solutions 13.4 Expressing Solution Concentration 13.5 Colligative Properties	From <b>Ref.1</b>
Weeks 10, 11	Chemical Kinetics 14.1 Factors that Affect Reaction Rate 14.2 Reaction Rates 14.3 Concentration and Rate Law 14.4 The Change of Concentration with Time 14.5 Temperature and Rate	From <b>Ref.1</b>
Weeks 12, 13, 14	Acid-Base Equilibria 16.1 Acids and Bases: A Brief Review 16.2 Brønsted-Lowery Acids and Bases 16.3 The Autoionization of Water 16.4 the pH Scale 16.5 Strong Acids and Bases 16.6 Weak Acids 16.7 Weak Bases 16.8 Relationship Between $K_a$ and $K_b$ 16.9 Acid-Base Properties of Salt Solutions 16.10 Acid-Base Behavior and Chemical Structure 16.11 Lewis Acids and Bases	From <b>Ref.1</b>
Weeks 14, 15	Additional Aspects of Aqueous Equilibria 17.1 The Common Ion Effect 17.2 Buffered Solutions	From <b>Ref.1</b>

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Perform stoichiometric calculations with units and applying rules of significant figures. [1a, 1b] [1L7K1, 1L7C4]	36%	First, Final
Know the periodic trends and different types of chemical bonds. Know the different gas laws and the general gas law and their applications and perform calculations involving gas phase reactions. Know properties of solutions and colligative properties. [1a, 1b] [1L7K1, 1L7S1, 1L7C2]	36%	First, Second, Final
Know the fundamentals of chemical kinetics, rate law, reaction order, and rate-temperature relationship. Know the chemistry of acids and bases, pH calculations, buffer calculations, and acid-base properties of salts. [1a, 1b, 1e, 1k] [1L7K1, 1L7S1, 1L7C2]	28%	Second, Final

Relationship to Program Student Outcomes (Out of 100%)										
a	b	c	d	e	f	g	h	i	j	k
43	43			7						7

Relationship to NQF Outcomes (Out of 100%)			
L7K1	L7S1	L7C2	L7C4
39.33	21.33	21.33	18

Evaluation	
Assessment Tool	Weight
First	30%
Second	30%
Final	40%

<b>Policy</b>	
Make-up exams	Make-up exams will be offered for valid reasons only with consent of the Dean. Make-up exams may be different from regular exams in content and format.
Attendance	Lecture attendance is mandatory. Student is allowed maximally 20% absentia of the total module hours. More than this percentage, student with an excuse will be drawn from the module. Otherwise, student will be deprived from the module with zero mark assigned.

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